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[CHD 17: Leather, Tanning Materials and Allied Products]



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IS : 5866 - 1979

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2009

Indian Standard

**SPECIFICATION FOR CHROME LEATHER
FOR HIGH ALTITUDE GLOVES**

(First Revision)

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INDIAN STANDARDS INSTITUTION
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**SPECIFICATION FOR CHROME LEATHER
 FOR HIGH ALTITUDE GLOVES**
(First Revision)

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AMENDMENT NO. 1 FEBRUARY 1996
TO
IS 5866 : 1979 SPECIFICATION FOR CHROME
LEATHER FOR HIGH ALTITUDE GLOVES

(First Revision)

[Page 6, Table 2, SI No. (iv), col 2 and 3] — Substitute the following for the existing matter:

(2)	(3)
'iv) Total ash, percent by mass, Max:	
a) For natural finish leather	3.0*
b) For white pigmented leather	6.0*

*Over the Cr₂O₃ content obtained in SI No.(i) of the Table.'

(Page 6, clause 3.8, line 2) — Substitute 'IS 2454 : 1985*' for 'IS : 2454 - 1967*'.

(Page 6, foot-note with '*' mark) — Substitute the following for the existing title:

**Methods for determination of colour fastness of textile materials to artificial light (xenon lamp) (first revision).'

Indian Standard
**SPECIFICATION FOR CHROME LEATHER
FOR HIGH ALTITUDE GLOVES**
(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 26 February 1979, after the draft finalized by the Leather Sectional Committee had been approved by the Chemical Division Council.

0.2 The leather prescribed in this standard is intended for the manufacture of gloves for defence personnel and others working at high altitudes, where ambient temperature is below 0°C. This type of leather is manufactured by full chrome tannage and finished in natural chrome colour with waterproof treatment.

0.3 This standard was originally published in 1970. At the instance of Ministry of Defence the Sectional Committee decided to revise the standard. In this revision an additional requirement for application of white pigment cover coat having light fastness property has been incorporated. Further, calf skin has been included as raw material in addition to goat and sheep skins.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for full chrome gloving leather, intended for the manufacture of high altitude gloves.

*Rules for rounding off numerical values (*revised*).

IS : 5866 - 1979

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 1640-1960* shall apply.

3. REQUIREMENTS

3.0 General — For the manufacture of this leather, well-preserved sheep, goat or calf skins free from adverse grain defects, cuts and holes shall be used.

3.1 Material — The leather shall be chrome tanned in either natural finish or with white pigment finish. The leather shall be soft and pliable. The flesh side of the leather shall be neatly buffed so as to have a clean surface without any loose fleshy portions and shall be neatly trimmed so as to be free from toggle, nail and punch marks.

3.1.1 The leather shall have a uniform colour, even thickness, smooth feel and compact texture. The leather shall be free from flay cuts, grain defects like pock marks, tick marks, cuts, pinholes, scratches, perforation, sore marks, vulture marks, abrasions, etc, except those given in 3.1.2.

3.1.2 Presence of grain defects mentioned above shall be permissible near the periphery within 4 cm for goat and sheep skins and within 8 cm for calf skins from the edge and also on the neck portion. The following grain defects may also be permitted along the ridge, that is, along the back-bone line within 1.5 cm on either side for goat and sheep skins and within 3 cm for calf skins;

- a) Four stray defects in the middle portion, and
- b) Two minor defects such as grain scratches and small blemishes.

3.2 Finish

3.2.1 Natural Colour Finish — The leather shall be neutralized and fat liquored. The leather shall not contain any loading material as surface coating or whitening agent, such as french chalk.

3.2.2 Treatment for Waterproofness — Leather shall be given suitable treatment for waterproofness so as to satisfy the tests prescribed in 3.5 and 3.6. No material which is known to be toxic or harmful to the skin and which may cause dermatitis, chafing or irritation shall be used for waterproofing. If desired by the purchaser, the nature of waterproofing agent shall be disclosed.

*Glossary of terms relating to hides, skins and leather.

3.2.2.1 A satisfactory method for waterproofing is described in Appendix A and is recommended. However, any other waterproofing treatment may be followed if it does not affect the feel of the leather and its breathing property.

3.2.3 White Pigment Finish — The leather shall also be finished with white pigments and a suitable binder. Such materials shall not be used in the finishing which on exposure to sunlight turn brown or yellow. A top coat of nitrocellulose lacquer emulsion shall be used.

3.3 The leather shall comply with the additional physical requirements given in Table 1.

TABLE 1 PHYSICAL REQUIREMENTS FOR CHROME LEATHER FOR HIGH ALTITUDE GLOVES

Sl. No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO METHOD GIVEN IN IS : 5914-1970*
(1)	(2)	(3)	(4)
i)	Thickness, range	0.7 to 1.0 mm	LP : 1 (Individual readings of thickness shall not vary from the mean by more than 0.1 mm)
ii)	Tensile strength, MPa, <i>Min</i>	15	LP : 6
iii)	Elongation at break, percent, <i>Min</i>	30	LP : 6
iv)	Double hole stitch tear strength, kN/m thickness, <i>Min</i>	44	LP : 8
v)	Crackiness of the grain	The grain shall not crack at the double fold when the leather is folded with grain side out	—
vi)	Water vapour permeability, g/m ² /h	20	LP : 21

*Methods of physical testing of leather.

3.4 The leather shall comply with the chemical requirements given in Table 2.

3.5 Pressure Head Test — The leather, when tested by the method given in 6.3, shall not show any leak-through of water during a period of 1 hour.

TABLE 2 CHEMICAL REQUIREMENTS FOR CHROME LEATHER FOR HIGH ALTITUDE GLOVES

(Clause 3.4)

Sl No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO METHOD GIVEN IN IS : 582-1970*
(1)	(2)	(3)	(4)
i)	Chromium content (as Cr_2O_3), percent by mass, <i>Min</i>	3.0	LC : 10
ii)	Solvent extractable substances, percent by mass	7.0 to 14.0	LC : 4
iii)	pH of water solubles, <i>Min</i>	3.5	LC : 18
iv)	Total ash, percent by mass, <i>Max</i>	2.5 over the Cr_2O_3 content obtained in Sl No. (i)	LC : 3

NOTE — The requirements given in col 3 except Sl No. (iii) are based on zero percent moisture basis.

*Methods of chemical testing of leather (*first revision*).

3.6 Water Penetration Test — The material, when tested by the method given in 6.4, shall not allow water to penetrate during a period of 1 hour.

3.7 Flexibility Test at Low Temperature — The leather, when subjected to a temperature of -28°C for 4 hours as described in 6.5, shall not become hard or stiff as compared to the original leather and the finish should not show any tendency to crack.

3.8 Fastness to Light — The leather finished with white pigment, when tested in accordance with IS : 2454-1967*, shall not lose its whiteness and shall have a fastness equivalent to standard 4.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed as agreed to between the purchaser and the supplier.

4.1.1 A recommended procedure is given in Appendix B.

4.2 Marking — Each skin shall clearly and legibly be marked at one corner on the flesh side of the skin with trade-mark, if any; size; month and year of manufacture.

*Method for determination of colour fastness of textile materials to artificial light (xenon lamp).

4.2.1 Individual skins or packages may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 Lot — Unless otherwise agreed to between the purchaser and the supplier, a lot shall consist of 1 000 skins.

5.2 Scale of Sampling — Samples for ascertaining conformity of the material shall be drawn out in accordance with the procedure prescribed in IS : 5868-1969*.

5.3 Examination for Visual Requirements — All the pieces in the sample selected from a lot shall be individually examined for each of the visual requirements, such as finish, size and shape. If any piece is found to be defective in any of the visual requirements, the entire lot shall be screened in respect of the visual requirements in order to remove all the defective pieces from the lot.

5.4 Tests for Physical Requirements — Each piece in the sample shall be tested for all the physical requirements individually. The lot shall be considered to have met the physical requirements if each piece individually satisfies all of these requirements. Otherwise the lot shall be rejected without further testing.

5.5 Tests for Chemical Requirements — If the lot has been found satisfactory in respect of physical requirements, it shall be subjected to the tests for all other requirements of this specification. The lot shall be declared to have met the requirements of this specification if all the test results, obtained by following the specified testing procedure, satisfy the relevant requirements of this specification.

6. TESTS

6.1 Unless otherwise agreed to between the purchaser and the supplier, carry out all tests within three months from the date of receipt of the leather by the purchaser.

*Method of sampling for leather.

IS: 5866 - 1979

6.2 Length and Width Measurement — Measure the length of the skins from neck to tail and the width from belly at centre of the skin without stretching the leather. The neck portion shall not protrude more than 150 mm from the curvature of the foreshank. For the purpose of measuring area, refer to LP : 4 of IS : 5914-1970*.

6.3 Pressure Head Test — Cut a circular piece of leather of 10 cm diameter and subject it to a 30 cm constant head of water (the grain side of leather being in contact with water) for 1 hour. Observe any leakage of water or wetting of the grain surface.

6.4 Water Penetration Test — The test pieces of leather as given in 6.3 shall be clamped on glass plate, grain side upwards, inclined at an angle of 45°. Water shall be allowed to drop from a glass jet on the face of leather from a height of 180 cm at the rate of 72 ± 2 drops per minute for 1 hour. Record the observation regarding penetration of water if any.

6.5 Flexibility Test at Low Temperature — Cut a test piece 10 cm square. Roll it up and insert it inside a test-tube. Prepare a freezing mixture using dry ice and denatured spirit, to give a temperature of -28°C inside a thermos flask. Immerse the test-tube containing the test piece into the freezing mixture and tightly stopper the thermos flask. Maintain the temperature of the freezing mixture at -28°C for 4 hours. At the end of 4 hours, take out the test piece quickly and examine its hardness and brittleness.

APPENDIX A

(Clause 3.2.2.1)

RECOMMENDED PROCEDURE FOR WATERPROOFING TREATMENT

A-1. COMPOSITION

A-1.1 Weigh 100 parts of toluene in a container and warm to 60°C over a water-bath. Add gradually 2 parts of aluminium stearate to toluene with stirring till the stearate is completely dispersed through the solution. Continue stirring of solution at 60°C till a clear transparent gel like mass is obtained. Add 20 parts of normal butyl acetate with thorough stirring till a clear solution is obtained. The quantity of butyl acetate may have to be slightly varied depending on the quality of aluminium stearate used.

*Methods of physical testing of leather.

A-2. TREATMENT

A-2.1 Spray the skins with the clear solution obtained in **A-1**. For this, each skin should be sprayed liberally with the waterproofing composition on the grain side. Dry the skins after spraying and then pack.

A P P E N D I X B

(*Clause 4.1.1*)

RECOMMENDED PROCEDURE FOR PACKAGING AND MARKING

B-1. PACKING

B-1.1 Place 20 skins one over the other with grain side down neck to neck and butt to butt except the four skins of the bottom which should have the flesh side down; roll and wrap with polyethylene sheet, 0.04 mm thick, and tie with 3-ply jute twine to form a bundle. Wrap 20 such bundles with one layer of kraft paper, wrapping one layer of waterproof packing paper and one outer layer of hessian cloth to form a bale. Stitch the bale properly by securely stitching with double 3-ply jute twine with not less than 12 stitches per 10 cm. Take care not to pierce the inner wrapping during stitching. Pull out sufficient hessian cloth at each corner to form ears about 15 cm in length.

NOTE — The overlaps of the outermost layer of hessian cloth shall be such that the hessian cloth can be properly and securely sewn around the bale and the overlaps of inner layer shall be at least 10 cm to ensure full protection to the contents of the bale.

B-2. BALES

B-2.1 For factory packs, the material should be packed according to the details given in **B-1** to form compact bales of approximate mass 250 kg.

B-3. MARKING

B-3.1 Each bale/package shall be marked legibly with the following details:

- a) Name of the material;
- b) Name of the manufacturer or trade-mark, if any;
- c) Quantity packed;
- d) Lot number;
- e) Month and year of packing;
- f) Net mass of the package in kg; and
- g) Total area of the skins packed in dm².

INDIAN STANDARDS ON LEATHER

IS:

- 575-1956 Chrome belt lace leather
- 576-1975 Glazed kid for shoe uppers (*first revision*)
- 577-1954 Upholstery leather
- 578-1971 Full chrome upper leather (*second revision*)
- 579 (Part I)-1973 Sole leather: Part I Vegetable tanned sole leather (*second revision*)
- 579 (Part II)-1973 Sole leather: Part II Water-resistant vegetable tanned sole leather (*second revision*)
- 580-1973 Harness leather (*second revision*)
- 581-1962 Vegetable tanned hydraulic leather (*revised*)
- 582-1970 Methods of chemical testing of leather (*first revision*)
- 622-1956 Russet leather
- 1015-1956 Leather pump buckets made from vegetable tanned leather
- 1017-1966 Chamois leather (*first revision*)
- 1636-1960 Chrome waxes sole leather
- 1637-1960 Cycle saddle leather
- 1639-1960 East India tanned kips and skins
- 1640-1960 Glossary of terms relating to hides, skins and leather
- 2276-1962 Vegetable and aluminium tanned snakeskins
- 2545-1963 Vegetable tanned lizardskins
- 2573-1975 Leather gauntlets and mittens (*first revision*)
- 2954-1978 Vegetable tanned leather for belting (*first revision*)
- 2960-1964 Bookbinding leather
- 2961-1973 Chrome retan upper leather (*revised*)
- 3020-1976 Leathers for oil seals (*first revision*)
- 3031-1964 Leather cash bag
- 3840-1979 Lining leather (*first revision*)
- 3946-1966 Leather for leg-guard
- 3982-1966 Sheepskin leather for orthopaedic linings
- 3983-1966 Goatskin parchment for orthopaedic purposes
- 3985-1966 Leather for rugby ball
- 3999-1967 Casein base aqueous pigments and finishes
- 4102-1967 Leather for shuttlecock caps
- 4191-1967 Leather for volleyball
- 4207-1967 Leather for football
- 4553-1967 Leather for cricket ball
- 5024-1968 Buffalo-butt leather for knee bushings
- 5034-1968 Chrome goatskin in wet blue condition
- 5570-1969 Pickled goatskins
- 5597-1970 Leather for boxing gloves
- 5609-1970 Leather for hockey ball
- 5677-1970 Shoe upper leather for direct moulding processes
- 5712-1970 Slickers for leather industry
- 5866-1979 Chrome leather for high altitude gloves (*first revision*)
- 5867-1970 Leatherboards for insoles
- 5868-1969 Methods of sampling for leather
- 5914-1970 Methods of physical testing of leather
- 6153-1971 Protective leather clothing
- 6191-1971 Methods of microbiological colour fastness and microscopical tests for leather
- 6351-1971 Unhairing and scudding knife for leather industry
- 6357-1971 Sulphated oil for leather fat liquoring
- 6369-1971 Fleshing knife for leather industry
- 6994 (Part I)-1973 Industrial safety gloves: Part I Leather and cotton gloves
- 7656-1975 Code of practice for curing and preservation of cattle hides and goat and sheep skins by wet salting method
- 7721-1975 Chrome tanned leather laces for heavy duty footwear
- 7742-1975 Synthetic emulsion resin binders
- 8121-1976 Chrome buff-calf skin in wet blue condition
- 8170-1979 Guidelines for identification of finished leather for export (*first revision*)

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	CONVERSION
Force	newton	N	1 N = 0.101 972 kgf
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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